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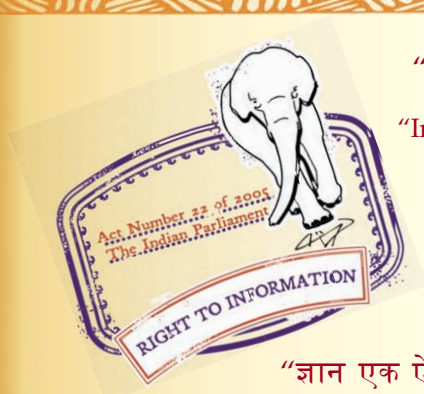
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IS 7751-1 (1975): Slide Switches, Part I: General Requirements and Tests [LITD 3: Electromechanical Components and Mechanical Structures for Electronic Equipment]



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“Knowledge is such a treasure which cannot be stolen”

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IS: 7751 (Part I) • 1975

Indian Standard

SPECIFICATION FOR SLIDE SWITCHES

PART I GENERAL REQUIREMENTS AND TESTS

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SPECIFICATION FOR SLIDE SWITCHES

PART I GENERAL REQUIREMENTS AND TESTS

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(Continued on page 2)

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IS: 7751 (Part I) - 1975

(Continued from page 1)

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Indian Standard

SPECIFICATION FOR SLIDE SWITCHES

PART I GENERAL REQUIREMENTS AND TESTS

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 30 July 1975, after the draft finalized by the Electromechanical Components for Electronic Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard deals with general requirements and tests for slide switches. Detailed requirements, including dimensions, for various types of slide switches will be covered in the relevant individual specification.

0.3 The object of the series of standards for slide switches is to establish:

- a) Uniform requirements for the electrical, mechanical and climatic tests;
- b) Uniform test methods; and
- c) Interchangeability.

0.4 This standard requires reference to IS:589-1961*, so far as the details of the climatic and mechanical testing procedures are concerned; only the relevant degrees of severity have been specified in this standard.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) applies to slide switches having a rated voltage not exceeding 250 V dc or ac or both and rated current not exceeding 2 A for use in electronic and telecommunication equipment.

NOTE— The relevant individual specification should indicate:

- a) the use in circuits of ac or dc, or ac and dc;
- b) the voltage rating; and
- c) the current rating.

*Basic climatic and mechanical durability tests for electronic components (*revised*).

†Rules for rounding off numerical values (*revised*).

1.2 This standard does not cover drive or indexing mechanism used as an accessory.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Slide Switch — A switch having the following features:

- a) Consisting of a casing or housing and a slide and having one or more switching contacts, and
- b) Operates when the slide is subjected to sliding motion in a straight line.

2.2 Slide — The moving element of the slide switch.

2.3 Casing or Housing — Fixed element of the sliding switch.

2.4 Spring Contact — Switch contact, a part of which is in the form of spring. In their normal condition, the springs are compressed and press against the flat contacts, thus establishing the electrical connection.

2.5 Position — Position of the slide with respect to the housing, at which any one of the desired contact configurations is established.

2.6 Drive Mechanism — Accessories including knob, if any, used to achieve the movement of the slide.

NOTE — This mechanism can be so devised that the movement of knob can be either rotary or in a straight line, though movement of the slide is only in a straight line.

2.7 Indexing Mechanism — Accessory parts used for holding the slide at desired position(s).

2.8 Electrical Rating — Combinations of maximum voltage and current under which the switch shall operate satisfactorily, with specified circuit conditions and at standard atmospheric conditions.

2.9 Rated Voltage and Current — Maximum voltage and maximum current combination, which the contacts are capable of interrupting for the specified number of operations.

2.10 Type Tests — Tests carried out to prove conformity with the requirements of this standard. These are intended to prove the general qualities and design of a given type of slide switch.

2.11 Acceptance Tests — Tests carried out on samples selected from a lot for the purpose of varifying the acceptability of the lot.

2.11.1 Lot—All slide switches of the same type, category and rating, manufactured by the same factory during the same period, using the same process and materials.

2.12 Routine Tests—Tests carried out on each slide switch to check the requirements which are likely to vary during production.

3. CLIMATIC CATEGORY

3.1 There shall be three preferred categories of slide switches, corresponding to their ability to withstand the climatic severities as given in Table 1 (*see* IS: 589-1961*).

TABLE 1 CATEGORIES OF SLIDING SWITCHES

CLIMATIC TEST	SEVERITY		
	Category 1	Category 2	Category 3
(1)	(2)	(3)	(4)
Dry heat	100°C	85°C	70°C
Cold	-55°C	-40°C	-10°C
Damp heat (long term)	56 days	56 days	21 days
Damp heat (accelerated)	6 cycles	6 cycles	2 cycles
Rapid change of temperature	+100°C to -55°C	+85°C to -40°C	Not applicable
Low air pressure	44 mbar	300 mbar	600 mbar

NOTE — In case of special requirements where the above categories cannot be applied strictly, other combinations of severity may be agreed to between the customer and the manufacturer provided such switches are chosen from IS: 589-1961 Basic climatic and mechanical durability tests for electronic components (*revised*).

4. MATERIALS AND WORKMANSHIP

4.1 The slide switches shall be constructed from suitable materials which shall be free from flaws and other defects and shall as far as practicable, conform to the relevant Indian Standard, if any.

4.1.1 When dissimilar metals are used in intimate contact with each other, protection against electrolytic corrosion shall be provided. The use of dissimilar metals in contact, which tends towards active electrolytic corrosion (particularly brass, copper and steel used in contact with aluminium or aluminium alloy) is not acceptable. However, metal plating or metal spraying of dissimilar base metals to provide similar or suitable abutting surface is permitted.

*Basic climatic and mechanical durability tests for electronic components (*revised*).

IS: 7751 (Part I) - 1975

4.2 Workmanship — All parts of the switch shall be manufactured in a thoroughly workmanlike manner, and in accordance with the good engineering practice.

5. MARKING

5.1 Each switch shall be clearly and indelibly marked with the following information in the order given below:

- a) Type indication according to relevant individual specification (if applicable), and
- b) Type number and trade mark of manufacturer (*see* Note).

NOTE — Marking of item (b) is imperative only if type indication according to relevant specification is not applicable.

5.2 The information given in **5.1** along with information specified below shall be given on the packing carton:

- a) Date of manufacture (which may be in coded form);
- b) Contact configuration, for example, 4 pole 3 way;
- c) Electrical ratings; and
- d) Country of manufacture.

5.3 Additional information may be given as agreed between the purchaser and the manufacturer on the switch or carton; and shall be so marked as not to confuse any confusion with markings as given in **5.1** and **5.2**.

5.4 The switches or its carton may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. TESTS

6.1 Conditions for Tests

6.1.1 General — The tests shall be carried out on the switches as received. The contacts shall not be cleaned or otherwise prepared unless otherwise specified.

6.1.2 Samples — The samples for tests shall be selected at random and shall be representative of the lot.

6.1.3 Atmospheric Conditions — Unless otherwise specified, tests shall be carried out under standard atmospheric conditions, as specified in IS: 589-1961*.

NOTE — Where it is impracticable to carry out measurements within the limits of the standard atmospheric conditions for testing, a note to this effect, stating the actual conditions of test, shall be added to the test report.

6.1.4 Preconditioning — Before measurements are made, the switches shall be stored at the temperature specified for measurements, for the duration of the standard recovery period, unless otherwise specified.

6.1.5 Drying — Where 'drying' is called for, the switches shall be stored for 96 ± 4 hours at a temperature of $55 \pm 2^\circ\text{C}$. The switches shall then be allowed to cool in a desiccator.

6.1.6 Electrical Rating — During tests, the current and voltage used shall be within electrical ratings unless otherwise specified.

6.2 Classification of Tests

6.2.1 Type Tests

6.2.1.1 The procedure for type tests shall be in accordance with IS: 2612-1965†. The minimum number of samples for type tests shall be 25.

6.2.1.2 The sequence for type tests shall be in accordance with Appendix A.

6.2.2 Acceptance Tests — The acceptance test shall be carried out on a limited number of samples which have passed the routine tests. The samples shall be selected in accordance with IS: 2612-1965†. Two groups of samples one for non-destructive tests (Group A) and the other for destructive tests (Group B) shall be selected and each group shall be subjected to the tests as given below in sequence indicated:

Group A	Group B
a) General examination (6.3.1),	a) Dimensions (6.3.2),
b) Contact resistance (6.4.1),	b) Sliding force (6.3.8),
c) Insulation resistance (6.4.3),	c) Soldering (6.3.3),
d) Voltage proof (6.4.4), and	d) Robustness of terminations (6.3.5), and
e) Radio frequency shunt resistance (parallel damping) (6.4.5).	e) Climatic sequence (6.5.1).

*Basic climatic and mechanical durability tests for electronic components (revised).

†Recommendations for type approval and sampling procedures for electronic components.

IS: 7751 (Part I) - 1975

6.2.3 Routine Tests — The following tests shall be carried out on each and every switch:

- a) General examination (6.3.1),
- b) Contact configuration (6.4.7), and
- c) Functional check (6.3.4).

6.3 Mechanical Tests

6.3.1 General Examination — The workmanship and finish shall be satisfactory and in accordance with 4. The marking shall be in accordance with 5.

6.3.2 Dimensions — The dimensions shall be checked for conformity with those specified in relevant individual specifications.

6.3.3 Soldering

6.3.3.1 The test shall be carried out in accordance with 7.18.2 of IS: 589-1961*, with the following specific details:

- a) *Solderability* — Temperature of bath shall be $230 \pm 10^{\circ}\text{C}$. The period of immersion shall be 2 ± 0.5 seconds.
- b) *Resistance to heat* — Temperature of bath shall be $350 \pm 10^{\circ}\text{C}$. The period of immersion shall be $3 \pm 1_0$ seconds.

6.3.3.2 The period of recovery shall be 30 minutes.

6.3.3.3 Tinning shall be satisfactory. There shall be no mechanical deterioration such as loosening of terminals.

6.3.4 Functional Check — The slide shall be moved in the housing. The movement of slide should be smooth. The slide should be able to take up all of the specified switching positions.

6.3.5 Robustness of Terminations

6.3.5.1 Tensile test — This test shall be carried out in accordance with 7.19.1 of IS: 589-1961*. The loading weight shall be as specified in the relevant individual specification.

6.3.5.2 Bend test — This test shall be carried out in accordance with 7.19.2 of IS: 589-1961*. The number of consecutive bends shall be two.

NOTE — This test is not applicable to slide switches having terminals intended for direct soldering on printed wiring boards.

6.3.5.3 After each of the test, there shall be no loosening of the terminal or visible sign of fracture. The switches shall meet the requirements of functional check test specified in 6.3.4.

*Basic climatic and mechanical durability tests for electronic components (revised).

6.3.6 Vibration

6.3.6.1 This test shall be carried out in accordance with 7.6 of IS: 589-1961*. The normal mounting as specified in the relevant individual specification shall be adopted. The degree of severity shall be as specified in the relevant individual specification.

6.3.6.2 During the test, following shall be checked:

- a) Continuity between contacts; and
- b) Variation in contact resistance, if specified (6.4.2).

NOTE — A continuous monitoring circuit is under consideration.

6.3.6.3 Terminals should not become loose. On visual inspection, the switches shall show no sign of mechanical deterioration. The switch shall meet the requirements of functional check test (see 6.3.4). Variation in contact resistance shall meet the requirements of relevant individual specification.

The tolerable degree of break of contacts shall be as specified in the relevant individual specification; unless otherwise specified, a break of contacts for more than 10 μ only should be considered as a break.

6.3.7 Bumping

6.3.7.1 This test shall be carried out in accordance with 7.5.1 of IS: 589-1961*.

Normal mounting as specified in the relevant individual specification shall be adopted.

6.3.7.2 During the test, following shall be checked:

- a) Continuity between contacts; and
- b) Variation in contact resistance, if specified (6.4.2).

NOTE — A continuous monitoring circuit is under consideration.

6.3.7.3 Terminals should not become loose. On visual inspection, the switches shall show no sign of mechanical deterioration. The switch shall meet the requirements of functional check test (see 6.3.4). Variation in contact resistance shall meet the requirements of relevant individual specification.

The tolerable degree of break of contacts shall be as specified in the relevant individual specification; unless otherwise specified, a break of contacts for more than 10 μ s only should be considered as a break.

*Basic climatic and mechanical durability tests for electronic components (revised).

6.3.8 Sliding Force

6.3.8.1 Normal mounting as specified in the relevant individual specification shall be adopted. The slide shall be moved from any position to an adjacent position and the required force shall be measured.

6.3.8.2 The sliding force should satisfy requirements specified in the relevant individual specification.

6.4 Electrical Tests

6.4.0 Where mounting is necessary, the normal mounting as specified in the relevant individual specification shall be adopted.

6.4.1 Contact Resistance

6.4.1.1 General measuring requirements — Measurement may be carried out with direct current or alternating current. The contact resistance shall normally be calculated from the potential difference measured between each pair of associated terminations. The contact shall be made before the measuring voltage is applied. In order to prevent the breakdown of insulating film on the contact, the source emf shall not exceed 20 mV (dc or ac peak). In order to prevent undue heating of the contacts the current shall not exceed 1 ampere or the value specified by the relevant individual specification. For ac measurements the frequency shall be $1\,000 \pm 200$ Hz. The measuring apparatus shall be such as to ensure an accuracy of at least ± 10 percent.

NOTE — For low current contacts for use in the microvolt range, modifications of the measuring method or special requirements or both may be specified by the relevant individual specification.

6.4.1.2 Measuring cycle

Measurement with dc — One measuring cycle consists of:

- a) Making the contact,
- b) Connection of voltage source,
- c) Measurement with current flowing in one direction,
- d) Measurement with current flowing in the opposite direction,
- e) Disconnection of voltage source, and
- f) Breaking the contact.

Measurement with ac — One measuring cycle consists of:

- a) Making the contact,
- b) Connection of the voltage source,
- c) Measurement,
- d) Disconnection of voltage source, and
- e) Breaking the contact.

6.4.1.3 Measurement—The contact resistance shall be measured between any two terminations that are to be connected by the switch. There shall be five measuring cycles. Measuring cycles shall be carried out in immediate succession.

6.4.1.4 Requirements—The value of the contact resistance for any individual measurement shall not exceed the value specified by the relevant individual specification.

6.4.1.5 Summary—When the test is required by the relevant individual specification the following details shall be specified:

- a) Maximum value of the current, if other than 1 ampere;
- b) Maximum value of the contact resistance; and
- c) Any deviation from the standard test method.

6.4.2 Variation in Contact Resistance

6.4.2.1 Method of measurement—The variation of contact resistance shall be determined during the vibration test. The measurement of the contact resistance shall be made throughout the whole of the last frequency sweep in each direction.

The variation of contact resistance shall be determined by means of a cathode-ray oscilloscope (with a long persistence screen) displaying the potential difference between the points intended for the connection of wiring to the contact when a direct current of 10 ± 2 mA is passed through the contact. The source emf shall not exceed 20 mV.

The measuring apparatus shall:

- a) have a frequency characteristic which is substantially flat between 400 Hz and 1 000 Hz with a decay below and above of not more than 3 dB at 70 Hz and 5 000 Hz,
- b) be such as to ensure a measuring accuracy better than ± 20 per cent, and
- c) be calibrated with a sinusoidal voltage at 1 kHz.

The number of contacts to be tested and the severity of the vibration test shall be specified by the relevant individual specification.

6.4.2.2 Requirements—The values of the voltages produced by variation of switch resistance shall not exceed the value specified by the relevant individual specification.

6.4.2.3 When the test mentioned in 6.4.2 is required by the relevant individual specification, the following details shall be specified:

- a) Limit of the values of the voltage produced by variation of contact resistance,
- b) Severity of the vibration test,
- c) Number of contacts to be tested and number of measurement, and
- d) Any deviation from the standard test method.

6.4.3 Insulation Resistance — The insulation resistance shall be measured with a dc voltage of 100 ± 15 or 500 ± 50 V as specified by the relevant individual specification. Measurement shall be made after an electrification time of $1 \text{ min} \pm 5 \text{ seconds}$.

The measurement shall be made:

- a) between two adjacent terminals, and
- b) between all terminals connected together and all other metal parts (if any).

6.4.3.1 The value of the insulation resistance shall be not less than the value specified in the relevant individual specification.

6.4.3.2 Summary — When the test mentioned in **6.4.3** is required by the relevant individual specification, the following details shall be specified:

- a) Value of the measuring voltage, and
- b) Any deviation from the standard test method.

6.4.4 Voltage Proof — The slide switches shall withstand without breakdown or flashover the test voltage, as specified in the relevant individual specification applied for a period of 1 minute between the points indicated in **6.4.3.1**.

6.4.5 Radio Frequency Shunt Resistance (Parallel Damping) — The resistance shall be measured at a frequency of 1 MHz. The measurement shall be made between:

- a) two adjacent terminals, and
- b) one terminal and all other terminals shorted.

6.4.5.1 Requirement — The RF shunt resistance shall be as specified in the relevant individual specification.

6.4.6 Capacitance — The measuring frequency shall be $1 \text{ MHz} \pm 10 \text{ percent}$. The measurement shall be made between any one terminal and all others connected together unless otherwise specified in the relevant individual specification.

6.4.6.1 Requirement — The capacitance value(s) shall not exceed that (those) specified in the relevant individual specification.

6.4.7 Contact Configuration — The test shall be conducted at each position of the switch, after moving the slide through maximum and minimum distance specified for change of position. Any suitable circuit shall be used to check continuity, for example, ohmmeter.

6.4.7.1 Requirement — Contacts which should be closed according to configuration shall show continuity, and contacts which should be open according to configuration shall not show continuity.

6.4.8 Noise (*crackle*) — Under consideration.

6.4.9 Overload Tests — The normal mounting as specified in the relevant individual specification shall be adopted. The slide shall be moved to and fro in a direction parallel to its axis. The extent of travel shall be sufficient to alternately 'break' and 'make' the contacts under test. The force applied to the slide shall not have any significant component in a direction different from the direction of sliding. The voltage and current applied to the contacts under test should be 1.1 times the rated voltage and 1.5 times the rated current respectively. The load should be resistive. The contacts should be 'broken' 50 times at a rate of 5 per minute.

6.4.9.1 Requirement — On visual inspection the contact surfaces should not show excessive burning.

6.5 Climatic Tests

6.5.0 General

6.5.0.1 Where mounting is necessary the normal mounting as specified in the relevant individual specification shall be adopted.

6.5.0.2 For single position ON/OFF switches the switch shall be kept in the OFF position during the climatic tests.

6.5.1 Climatic Sequence

6.5.1.1 Dry heat — This test shall be carried out in accordance with 7.2 of IS: 589-1961*. The temperature shall be as specified in 3.1 for the appropriate category of the slide switch, according to relevant individual specification.

While still at high temperature, the insulation resistance shall be measured and shall be not less than the values specified in the relevant individual specification.

The switch shall pass the functional check test (*see 6.3.4*) at the high temperature.

After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

6.5.1.2 Damp heat (*accelerated*) (*first cycle*) — The first cycle of this test shall be carried out in accordance with 7.4 of IS: 589-1961*. After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

After recovery, the switches shall be subjected to visual examination. The marking shall be legible.

*Basic climatic and mechanical durability tests for electronic components (*revised*).

IS:7751 (Part I)-1975

6.5.1.3 Cold—This test shall be carried out in accordance with 7.1 of IS: 589-1961*. The temperature shall be as specified in 3.1 for the appropriate category, according to the relevant individual specification.

The switches shall pass the functional check test (see 6.3.4) at the low temperature.

After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

After recovery, the switches shall be visually examined. There shall be no deterioration.

6.5.1.4 Low air pressure—This test shall be carried out in accordance with 7.12 of IS: 589-1961*. The pressure shall be as specified in 3.1 for the appropriate category, according to the relevant individual specification. The temperature of the test chamber shall be maintained between 15°C and 35°C. The test duration shall be 5 minutes.

The switches shall be subjected to a voltage proof test specified in 6.4.4 at the low air pressure. The test voltage for voltage proof test shall be $2 \times$ rated voltage. During and after this test there shall be no breakdown or flashover.

6.5.1.5 Damp heat accelerated (remaining cycles)—This test shall be carried out for the remaining number of cycles of this test in accordance with 7.4 of IS: 589-1961*.

NOTE — Remaining damp heat cycles required are as follows (see 3.1):

Category 1 : 5 cycles

Category 2 : 5 cycles

Category 3 : 1 cycle

After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to this test.

6.5.1.6 Final measurements—The switches shall then be subjected to following tests and shall meet the requirements specified in the relevant individual specification:

- a) Insulation resistance (see 6.4.3),
- b) Voltage proof (see 6.4.4),
- c) Contact resistance (see 6.4.1),
- d) General examination (see 6.3.1),

*Basic climatic and mechanical durability tests for electronic components (revised).

- e) Functional check (see 6.3.4), and
- f) Noise (see 6.4.8).

NOTE — The first two tests shall be carried out immediately following the recovery period and in the contact position in which the devices are removed from the chamber. Insulation resistance and voltage proof (high voltage) may be checked in other positions after the contact resistance has been measured.

6.5.2 Damp Heat (Long Term)—This test should be carried out in accordance with 7.3 of IS: 589-1961*. Duration of test shall be as specified in 3.1 for the appropriate category, according to the relevant individual specification.

A polarising voltage is to be applied to the switch contacts during the test. For this purpose the switches to be subjected to this test are to be divided into three groups of equal number of samples. The three groups are to be tested as follows:

- Group 1 : Without polarising voltage
- Group 2 : Polarising voltage applied between two adjacent terminations
- Group 3 : Polarising voltage applied between all terminations connected together and metal parts. The positive potential shall be applied to the terminations. The value of the polarising voltage shall be as specified in the relevant individual specification.

After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

6.5.2.1 Final measurements—The switches shall then be subjected to following tests and shall meet the requirements specified in the relevant individual specification:

- a) Insulation resistance (see 6.4.3),
- b) Voltage proof (see 6.4.4),
- c) Contact resistance (see 6.4.1),
- d) General examination (see 6.3.1),
- e) Functional check (see 6.3.4), and
- f) Noise (see 6.4.8).

NOTE — The first two tests shall be carried out immediately following the recovery period and in the contact position in which the devices are removed from the chamber. Insulation resistance and voltage proof (high voltage) may be checked in other positions after the contact resistance has been measured.

*Basic climatic and mechanical durability tests for electronic components (revised).

6.5.3 Rapid Change of Temperature—This test is applicable to switches of category I and II only. This test shall be carried out in accordance with 7.14 of IS:589-1961*. The total number of cycles shall be 5.

After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

6.5.3.1 Final measurements—The switches shall be subjected to following tests :

- a) Insulation resistance (see 6.4.3),
- b) Voltage proof (see 6.4.4),
- c) General examination (see 6.3.1), and
- d) Functional check (see 6.3.4).

6.6 Endurance Tests

6.6.1 The normal mounting as specified in the relevant individual specification shall be adopted. The slide is moved to and fro in a direction parallel to its axis. The extent of travel being sufficient to alternately 'break' and 'make' the contacts under test. The force applied to the slide shall not have any significant component in a direction different from the direction of sliding. Movement of slide from the 'make' position to 'break' position and back to 'make' position will form one duty cycle. The number of cycles shall be 10 000 and the rate of operation shall be 6 cycles per minute. During the test the contacts shall be subjected to rated voltage and rated current.

6.6.2 Circuit Conditions—The samples for this test should be divided into two groups and subjected to endurance test with following circuits conditions:

a) *Inductive circuit*

- 1) The test shall be carried out using an inductive circuit with the dc voltage and current as specified in the relevant individual specification.
- 2) The circuit used for this test shall have a time constant between 2 and 3 ms.
- 3) The duty cycle shall be approximately 25 percent 'on' and 75 percent 'off'.

*Basic climatic and mechanical durability tests for electronic components (*revised*).

b) *Resistive circuit*

- 1) The test shall be carried out using a resistive circuit with the ac voltage and the current as specified in the relevant individual specification.
- 2) For independent buttons the duty cycle shall be approximately 50 percent 'on' and 50 percent 'off'.

6.6.3 After completion of the test, the switches shall be removed from the chamber and exposed to the standard recovery conditions appropriate to the test.

6.6.4 After recovery, the switches shall be subjected to following tests and shall meet the requirements specified in the relevant individual specification:

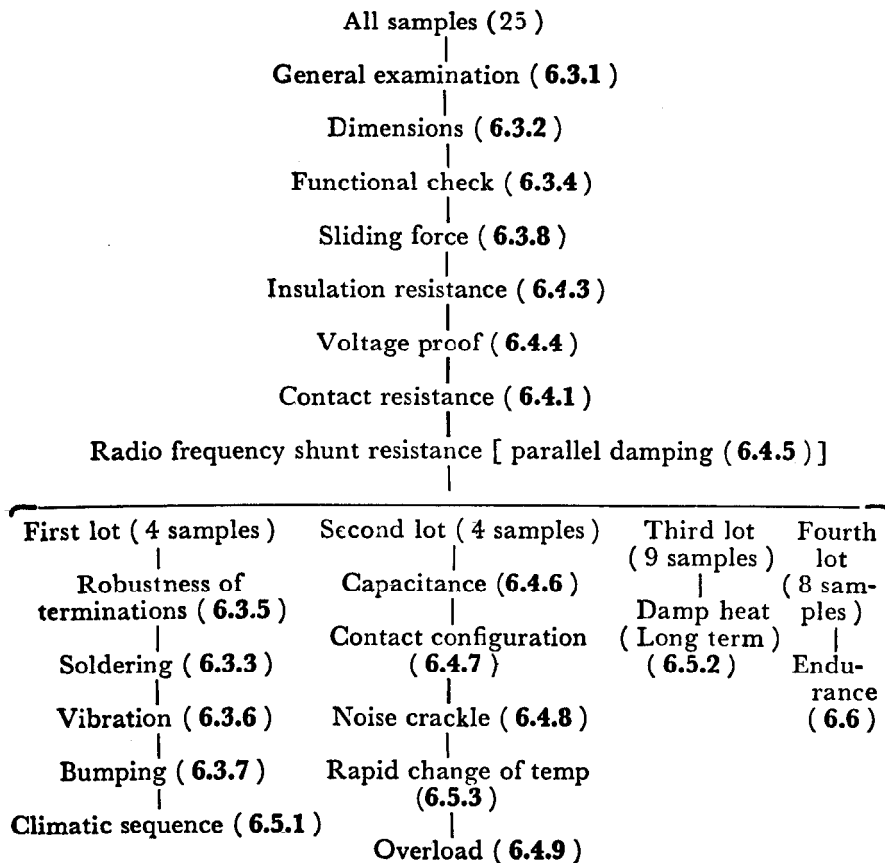
- a) Insulation resistance (*see 6.4.3*),
- b) Voltage proof (*see 6.4.4*),
- c) Contact resistance (*see 6.4.1*),
- d) General examination (*see 6.3.1*), and
- e) Functional check (*see 6.3.4*).

6.6.5 Requirements shall be as specified in relevant individual specification.

A P P E N D I X A

(*Clause 6.2.1.2*)

SEQUENCE OF TYPE TESTS



INDIAN STANDARDS

ON

ELECTROMECHANICAL COMPONENTS FOR ELECTRONIC EQUIPMENT

IS:

- 1885 (Part VI)-1965 Electrotechnical vocabulary : Part VI Printed circuits
- 1885 (Part XXVI)-1968 Electrotechnical vocabulary: Part XXVI Telecommunication relays
- 1885 (Part XXXX)-1974 Electrotechnical vocabulary: Part XXXX Connectors
- 2612-1965 Recommendation for type approval and sampling procedures for electronic components
- 2628 (Part I)-1964 Rotary wafer switches (low current rating) : Part I Tests and general requirements
- 2628 (Part II)-1967 Rotary wafer switches (low current rating) : Part II Rotary wafer switches with central mounting
- 2926-1964 Dimensions of connectors for radio batteries
- 3354 (Part I)-1965 Valve sockets: Part I General requirements and tests
- 3354 (Part II)-1965 Valve sockets: Part II Dimensions and construction of gauges and tools
- 3354 (Part III)-1967 Valve sockets: Part III Valve sockets for octal base
- 3354 (Part IV)-1967 Valve sockets: Part IV Valve sockets for 9-pin miniature base
- 3452 (Part I)-1966 Toggle switches: Part I General requirements and tests
- 3452 (Part II)-1970 Toggle switches: Part II Toggle switches, Type I and Type II
- 3544-1966 General requirements and tests for tag strips
- 3720-1966 Dimensions of polarized plugs for hearing aids
- 3826 (Part I)-1966 Connectors for frequencies below 3 Mc/s: Part I General requirements and tests
- 3826 (Part II)-1966 Connectors for frequencies below 3 Mc/s: Part II Battery connectors for electronics equipment
- 4007 (Part I)-1967 Terminals for electronic equipment: Part I General requirements and tests
- 4586-1968 Dimensions of spindles and details of mechanical fixing devices used in electronic equipment
- 4794 (Part I)-1968 Push-button switches: Part I General requirements and tests
- 4795 (Part I)-1968 Holders for indicator lamps for electronic and telecommunication equipment: Part I General requirements and tests
- 5033-1969 Telescopic aerials for portable radio receivers
- 5051 (Part I)-1969 Non-sealed electromagnetic relays for electronic and telecommunication equipment: Part I General requirements and tests

- 5921 (Part I)-1970 Metal-clad base materials for printed circuits for use in electronic and telecommunication equipment: Part I General requirements and tests
- 5921 (Part II)-1973 Metal-clad base material for printed circuits for use in electronic and telecommunication equipment: Part II Paper phenolic copper-clad laminated sheet — PF-CP-CU economic grade
- 6089 (Part I)-1971 Sensitive switches: Part I General requirements and tests
- 6102 (Part I)-1971 Finger knobs used in electronic and telecommunication equipment: Part I General requirements and tests
- 7405 (Part I)-1973 Printed wiring boards: Part I General requirements and tests